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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,082	04/24/2001	Joo Soo Lim	049128-5006	2174

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EXAMINER
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QI, ZHI QIANG

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/840,082

Applicant(s)

LIM ET AL.

Examiner

Mike Qi

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 February 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5-7,9,11-13,15-17,19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7,9,11-13,15-17,19 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5-7, 9, 11-13, 15-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 6,297,862 (Murade).

Claims 1, 5, 9, 11, 15 and 19, AAPA discloses (paragraph 0006 – paragraph 0010; Figs. 1-3) a conventional liquid crystal display comprising:  
(concerning claims 1 and 11)

- a pixel electrode (10) at a pixel area between a gate line (14) and data line (13);
- a switching device (thin film transistor TFT) (12) at an intersection between the gate line (14) and the data line (13), and the function of the TFT is to drive the pixel electrode in order to display image;
- drain electrode (7) of the TFT (12) is made of metal (metal thin film) connected to the pixel electrode (10) (see Fig.2);
- a light-shielding member (black matrix) (11) overlapping the switching device, (TFT) (12);

(concerning claims 5 and 15)

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- a charging device (a storage capacitor 19 between the gate line 14 as the lower electrode and the upper metal thin film 15 as the upper electrode) on the gate line (14), therefore, the charging device is a storage capacitor (19) including the upper electrode (metal) (15) and the gate line (14) and a gate insulating layer (4) (dielectric layer) between the gate line (14) and the upper electrode (15); or forming a charging device including upper electrode (15) made of metal over the gate line (14) and a gate insulating layer (dielectric layer);
- a light-shielding member (black matrix) (11) overlapping the drain electrode (7) of the switching device (TFT) (12) (the metal thin film);
- a light-shielding member (black matrix) (11) overlapping the charging device (19) (the storage capacitor);

(concerning claims 1, 9 and 19)

- drain electrode (7) made of metal (first metal thin film) connected to the pixel electrode (10) (see Fig.2);
- upper electrode (15) made of metal (second metal thin film) over the gate line (14) and a gate insulating layer (4) (dielectric layer);
- a light-shielding member (black matrix) (11) on a front substrate (2) opposed to the rear substrate (1), and at a boundary portion between pixel areas (10) (see Figx.1 and 2);
- a light-shielding member (black matrix) (11) for blocking light incident onto the drain electrode (7) (first metal thin film) of the switching device (TFT) (12) and

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for blocking light incident onto the storage capacitor upper electrode (15)  
(second metal thin film).

AAPA does not expressly disclose the light-shielding member (black matrix) extending from an end at the pixel electrode side of a drain electrode (metal thin film) of the TFT (the extending portion would be a dummy black matrix) and extending from an end at the pixel electrode side of the storage capacitor upper electrode (metal thin film) (the extending portion would be a dummy black matrix) into the pixel area, and the light-shielding member (black matrix) covering and extending past all sides of the drain electrode (metal thin film) with a margin sufficient to block light incident on the metal thin film.

However, Murade discloses (col.7, line 11 – col.9, line 67; col.16, line 43 – col.17, line 53; Figs.1, 2, 11-14, 20) that the shielding film (black matrix 6) is formed around the pixel, and the shielding film (black matrix 6) covering the switching device (TFT, such as the source/drain regions 1a and 1b) and extending from the drain region into the pixel area, and the light shielding member (black matrix 6) covering and extending over the drain/source region, and the light shielding member (black matrix 6) also extending over the upper electrode of a storage capacitor (any two conductive layers and an insulating layer would constitute a capacitor) such as the data line (3) made of metal (aluminum) and gate line (2) (or there is a metal film 7) and insulating film (13, 12, 11) that constitutes a capacitance (charging device or storage capacitor) , and that is sufficient to block light incident onto the drain/source region (the metal thin

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film), and the light incident on the liquid crystal device does not affect the TFT performance, and a bright, high quality images will be ensured.

Since such light-shielding arrangement would sufficiently block the light incident to the TFT, so as to minimize the leakage current of the TFT. Murade indicates (col.9, lines 58 –67) that such black matrix (6) as shown in Fig.2 covering (overlapping and extending) the TFT including the drain electrode and storage capacitance and the side portion of the pixel electrode would present a display of high quality images free from image degrading effect such as cross-talk.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to extend the light-shielding film covering the drain electrode and covering the storage capacitor upper electrode from an end of the pixel electrode side, i.e., a light-shielding member (black matrix) covering and extending the drain electrode (metal thin film) and covering the upper electrode of a storage capacitor (charging device) with a margin sufficiently blocking light incident onto the drain electrode as claimed in claims 1, 5, 9, 11, 15 and 19 for minimizing the leakage current of the TFT, improving the display contrast, and presenting a display of high quality images free from image degrading effect such as cross-talk.

Claims 2, 6, 12 and 16, AAPA discloses (paragraph 0006 – paragraph 0010; Figs. 1-3) that the light-shielding member (11) is at a front substrate (2) opposed to a rear substrate (1) which includes the switching device (TFT 12), pixel electrode (10), the charging device (storage capacitor 19), and a liquid crystal layer between the two substrates.

Claims 3, 7, 13 and 17, AAPA discloses (paragraph 0006 – paragraph 0010; Figs. 1-3) that the light-shielding member is a black matrix.

3. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Murade as applied to claims 1-3, 5-7, 9, 11-13, 15-17 and 19 above, and further in view of US 6,266,117 (Yanagawa et al).

Claim 21, lacking limitation is such that the material of the light-shielding member is an organic material containing a black pigment,

However, Yanagawa discloses (co.7, lines 1-2) that the light shielding film is made of an organic resin in which, e.g., black pigment is dispersed, so that using the organic resin containing a black pigment as a light shielding member would be a routine skill in the art, and that was common and known in the art as the light shielding property of the organic material containing a black pigment to absorb light.

Therefore, it would have been obvious to those skilled in the art to use an organic material containing a black pigment as a light shielding member as claimed in claim 21 for shielding light because the organic material containing a black pigment having the property to absorb light.

### ***Response to Arguments***

4. Applicant's arguments filed on Feb.3, 2005 have been fully considered but they are not persuasive.

The secondary reference Murade clearly discloses (col.7, line 11 – col.9, line 67; col.16, line 43 – col.17, line 53; Figs.1, 2, 11-14, 20) that the shielding film (black matrix

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6) is formed around the pixel, and the shielding film (black matrix 6) covering the switching device (TFT, such as the source/drain regions 1a and 1b) and extending from the drain region into the pixel area, and the light shielding member (black matrix 6) covering and extending over the drain/source region, and the light shielding member (black matrix 6) also extending over the upper electrode of a storage capacitor (any two conductive layers and an insulating layer would constitute a capacitor) such as the data line (3) made of metal (aluminum) and gate line (2) (or there is a metal film 7) and insulating film (13, 12, 11) that constitutes a capacitance (charging device or storage capacitor) (AAPA also discloses the black matrix 11 covering the storage capacitor 19 as shown in Fig.3), and that is sufficient to block light incident onto the drain/source region (the metal thin film), and the light incident on the liquid crystal device does not affect the TFT performance, and a bright, high quality images will be ensured. The reference Murade described in the summary of the invention that a black matrix can be safely omitted which does not mean without black matrix in the liquid crystal display device, and the Figs 1 and 2 clearly show the black matrix (6) covering and extending overlapping the drain electrode and a capacitance and the side of the pixel electrode.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within



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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi  
April 2, 2005



**ROBERT H. KIM**  
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